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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,864	11/19/2003	Gary A. Frazier	004578.1383	1706

7590 12/13/2005  
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EXAMINER

LIVEDALEN, BRIAN J

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/717,864

Applicant(s)

FRAZIER, GARY A.

Examiner

Brian J. Livedalen

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 11-13 is/are rejected.
- 7) ☒ Claim(s) 8-10 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 11/19/2003.
- 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method and apparatus for optically resetting a high speed latch circuit.

### ***Claim Objections***

Claim 3 objected to because of the following informalities: "a latch coupled to a third node disposed between said first and first and second resonant tunneling diodes" is grammatically incorrect. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomoyuki (JP11068521).

In regard to claims 1 and 11, Tomoyuki discloses (fig. 2) an apparatus comprising a latch circuit which includes: first and second tunneling devices (1, 2)

coupled in series with each other between first and second nodes (11, not numbered); and a reset portion coupled to the first and second nodes, the reset portion including a photodiode (3) portion which is responsive to varying photonic energy for switching between first and second states which are different, wherein when the photodiode portion is in the first state the reset portion normalizes a voltage across each of the resonant tunneling devices. With the device set forth above, the method of claim 11 is inherent because the photodiode being in the first state would automatically cause the photodiode portion to normalize a voltage across the resonant tunneling diodes.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art "Sketch A" herein referred to as APA in view of Tomoyuki (JP11068521).

In regard to claims 1 and 11, APA discloses (Sketch A) an apparatus comprising a latch circuit which includes: first and second tunneling devices (not numbered) coupled in series with each other between first and second nodes (not numbered); and a reset portion (transistor) coupled to the first and second nodes. APA fails to disclose the reset portion being a photodiode. However, Tomoyuki discloses (fig. 2) reset

portion including a photodiode (3) portion, which is responsive to varying photonic energy for switching between first and second states which are different. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a photodiode as a reset means in order to increase the speed of the circuit. APA in view of Tomoyuki further discloses that when the photodiode portion is in the first state the reset portion normalizes a voltage across each of the resonant tunneling devices. With the device set forth above, the method of claim 11 is inherent because the photodiode being in the first state would automatically cause the photodiode portion to normalize a voltage across the resonant tunneling diodes.

Claims 2-7, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art "Sketch A" herein referred to as APA in view of Tomoyuki (JP11068521) as applied in claims 1 and 11, and in further view of van der Wagt (5953249).

In regard to claims 2-4 and 12, APA in view of Tomoyuki discloses (Sketch A) the resonant tunneling devices being resonant tunneling diodes; and a latch input terminal (Data In) coupled to a third node (not numbered) through a resistive element and disposed between the first and second resonant tunneling diodes; and a latch output terminal (Latch Out) coupled to the third node. APA in view of Tomoyuki is not explicit regarding the two resonant tunneling diodes being substantially identical. However, van der Wagt discloses fig. 1a) a system with two resonant tunneling diodes that are in series and are substantially identical (column 4, lines 9-20). It would have been obvious

to one of ordinary skill in the art at the time the invention was made to make the resonant tunneling diodes identical in order for the circuit to function with symmetry.

In regard to claims 5-7, and 13, APA in view of Tomoyuki in further view of van der Wagt further discloses (Sketch A) a first bias terminal to which is applied a first bias voltage ( $V^+$ ); a second bias terminal to which is applied a second bias voltage ( $V^-$ ) different from the first bias voltage; a first resistive element ( $R$ ) coupled between the first bias terminal and the first node; and a second resistive element ( $R$ ) coupled between the second bias terminal and the second node; wherein the first and second resistive elements have substantially the same resistive characteristic; and wherein one of the first and second bias voltages is a positive voltage, and the other thereof is a negative voltage substantially equal and opposite in magnitude to the positive voltage. APA in view of Tomoyuki further discloses (Sketch A) the photodiode portion includes a photodiode coupled between first and second nodes, the photodiode being conductive in the first state of the photodiode portion, and being substantially nonconductive in the second state of the photodiode portion.

#### ***Allowable Subject Matter***

Claims 8-10 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claims 8-10 and 14 are not anticipated or made obvious by the prior art of

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record. The prior art fails to disclose a latching circuit with two photodiodes that both are conductive in one state and non-conductive in another state.



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